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THE BIRDFISH

WINTER 2010

Churchill Northern Studies Centre Newsletter

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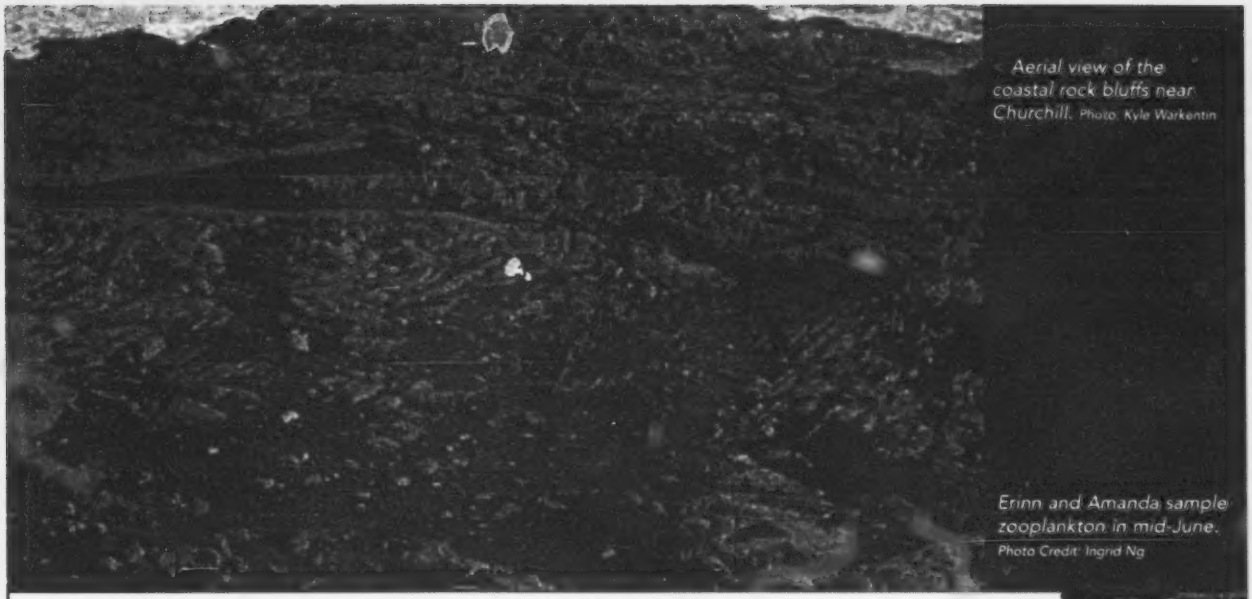


Aerial view of the coastal rock bluffs near Churchill. Photo: Kyle Warkentin

Erinn and Amanda sample zooplankton in mid-June.
Photo Credit: Ingrid Ng

The Adventures

of the Three Planktoneers: Rock bluffs and metacommunities

By Amanda Winegardner and Ingrid Ng, University of Guelph

We had the good fortune of being planktoneers this summer — more specifically, members of the *"Three Planktoneers"*. The Three Planktoneers are a trio from the University of Guelph who, for two summer months this year, happily called the CNSC and its surrounding rock bluffs home. We came to Churchill to search for infinite zooplankton metacommunity wisdom, and left with our minds fuller, our bear vision sharper, and our bug bites far more numerous than when we started.

Zooplankton are tiny organisms that inhabit many different kinds of aquatic habitats, and metacommunities are ecological communities that are linked to each other through dispersing individuals. Containing hundreds of small rock pools teeming with zooplankton life, the Churchill rock bluffs on the coast of Hudson Bay sustain several zooplankton metacommunities. This makes it the ideal place to seek answers to our endless questions: *What determines the zooplankton community in each rock pool? How do the zooplankton move around and between the bluffs? How do the zooplankton communities respond to environmental changes?* Currently, we are most interested in the last question; with the sub-Arctic in a period of environmental change, the time seems right for the asking.

What goes on in the coastal rock pools is strongly influenced by what goes on in the ocean. Environmental changes in the ocean (such as changes in water level, evaporation, temperature, and storm events) will lead to environmental changes on land as well. In terms of the rock pool environment, it is the salinity or "saltiness" of the water that may be significantly altered by the oceanic changes. If you are a zooplankton, the salinity of your environment matters a lot to you – depending on what species you are, you can only tolerate a certain range of salinity. So, we wanted to better understand the effects that potential salinity changes might have on coastal zooplankton. We spent the summer manipulating the salinity in a small portion of the Churchill rock bluffs. We are now measuring how the zooplankton communities adapted and changed to these manipulations. We can later apply our results to other kinds of metacommunities and ecosystems, and predict what might happen on a larger spatial and time scale. In this way, these zooplankton rock pool communities act as ecological indicators of environmental change.

Working on the rock bluffs, or "bluffing" as we came to call it, invariably led to a few mishaps on the slippery rocks, with each of us falling into pools a few times throughout the summer. We considered it all good training, though, for the big test of the winter – sorry, summer – season: the annual relay Hudson Bay

"Working on the rock bluffs, or "bluffing" as we came to call it, invariably led to a few mishaps on the slippery rocks, with each of us falling into pools a few times throughout the summer."

Dip organized by Parks Canada. On a positively balmy 12°C July day, the Three Planktoneers and a few honourary members donned planktoneering garb – think musketeer costumes made out of garbage bags, with the special added touch of cardboard pendants depicting our favourite *Daphnia* species. Dressed thus, we dodged the few remaining bergy bits and plunged into the waters of Hudson Bay. Our costume-making efforts and considerable spluttering and floundering in the water were not for vain, as at the end of it all, the winners of the best costume category were announced as *"the Garbage Bag People."* We decided it was best to accept our trophies without trying to explain that our waste-management costumes were actually supposed to be planktoneer apparel. I should also mention that the other CNSC team, decked out as *The Beatles' "Yellow Submarine"*, beat us in the actual race part of the Dip...must have been their lack of waterlogged garbage bags.

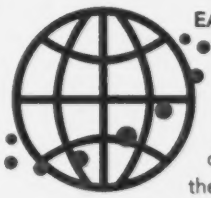
The unique community at the CNSC really made our field season a success this year and we are already planning our fieldwork for the upcoming year. The staff and fellow researchers were endlessly supportive and we were continually amazed by the wealth of knowledge available. We hope to spend at least a few more seasons doing science in Churchill, all the while improving our *"bluff legs"*.

The Environment Canada radiometer system is tested near North Bay, Ontario, ahead of deployment in Churchill during the 2009/10 winter season.
Photo Credit: Arvids Silis, Environment Canada.

RESEARCH IN ACTION

Churchill-based Snow Sampling Program

By Dr. Chris Derksen, Environment Canada, Climate Processes



EARTH OBSERVATION SATELLITES ARE an important source of information that is used for many purposes, including weather forecasting, monitoring natural resources, and observing environmental changes in inaccessible regions such as the Arctic. The process by which these satellites are conceived, designed, constructed, and launched can take many years and involves input from engineers on satellite and sensor design, and from applications scientists on how the data will be used. The European Space Agency (ESA) is currently in the competitive process of selecting a new satellite mission for launch in 2016. One of three remaining candidate missions is the COld REgions Hydrology High-resolution Observatory (CoReH2O) which has the primary objective of using spaceborne radar to improve the measurement of snow and ice properties across the globe.

Churchill will be a focal point for field measurements during the 2009/10 winter season that will be a Canadian contribution to the scientific development of the CoReH2O mission. With support from the Canadian Space Agency, scientists from Environment Canada and the University of Waterloo, along with partners from other Canadian and international universities, will measure seasonal changes in snow and lake ice properties, and relate these changes to measurements from ground based radiometers and radars. The radiometers provide the same measurements as are available from existing satellite sensors, while the radars mimic the potential CoReH20 sensors. These field measurements will extend from November, when the snow is shallow and lake ice is thin, to May when the snow begins to melt and the lake ice is over a metre thick. The Churchill area was selected for this campaign because it contains a wide range of snow characteristics in a localized area (such as tundra, forest, and snow on lake ice) and the logistical support from the Churchill Northern Studies Centre allows the deployment of the technically complex radar and radiometer instruments.

A field campaign of this nature has never been conducted before in Canada, so unique new observations of snow and ice coupled with radiometer and radar measurements will be made. Although the future status of the CoReH20 mission is yet to be determined, the field measurements from Churchill this winter are poised to make an important contribution to determining the scientific feasibility of the mission.

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Photos: Kim Daley

Belugas in the Bay

Biology of the Beluga Whale • July 15 – 20, 2010

$ 1125 CDN **Participants: 16**

The Churchill River estuary is the summering grounds for one of the largest populations of beluga whales in the Arctic. Nowhere else in the world can you get as up close and personal with these charming and highly vocal whales. While other beluga populations deal with the threats of pollution and population decline (or both), Churchill's whales migrate to the river to feed, give birth and moult their skin. As a participant in Belugas in the Bay, you will have three opportunities to view beluga whales on the Churchill River - once by large jet boat, once by zodiac and finally, under your own power by river kayak. Whales are only one part of the experience. You will also enjoy a walking tour of Prince of Wales Fort and Cape Merry National Historic Site. Evening lectures by whale biologists and local cultural presenters help round out this truly educational experience. ❄

Bunking with the Scientists...

By Riley & Karen Caton, Gresham, Oregon

"YOU ARE GOING WHERE? TO DO WHAT?" Yes, those are the questions we received when we told family and friends we were going to volunteer at CNSC.

The answer was always, "we'll wash dishes all day for the chance to see a polar bear in the wild!" For five weeks, we washed dishes, cleaned rooms, made beds, mopped floors, washed more dishes, and assisted with many other tasks. And though summer came late to Churchill this year, the tundra bloomed, the red fox kits appeared, the bears came in off the ice, and the belugas filled the river. We witnessed it all; with awe, inspiration, and respect for the researchers who spend months following their goals and dreams.

We met interesting people from all over Canada, the U.K., and the U.S. We hiked with researchers and helped on their projects. We held baby plover chicks as they were being banded with Rita and Simone, and gosling chicks with Tom, Shawn, Jess, and Jay. We watched in awe as Carla and Vanya fed baby yellow warblers with an eye dropper. And, yes, we slipped into tidal pools following the lead of Amanda, Erinn, and Ingrid, our favorite planktoneers!

Volunteering at CNSC may not be for everyone. The work can be tiring and long and sometimes you feel like you haven't been outside for days. But, knowing you are helping in your own small way to support the science that is making a difference in our world makes it all worthwhile.

Our thanks to Volunteer Coordinator Heather MacLeod, and the entire CNSC staff for making our volunteer experience such a wonderful adventure. We wish everyone the best of luck during construction of the new building and renovation of the current one. Life will certainly be easier with more space, more bathrooms, and a larger kitchen. Remember, though, there will always be another dish that needs to be washed! ❄

L-R: Volunteers Riley and Karen Caton pose with CNSC cooks Audrey Chislett, Rosalind and Robert Ellsworth, and volunteer Emma Berry.

VOLUNTEERS

Three Peaks and Three Cheers to All Our Volunteers

Climb Every Mountain-that is Steven Stamp's motto after completing the Three Peaks Challenge where he climbed the highest mountains in Scotland, England and Wales in 23 hours and 52 minutes! Now he has returned to Churchill to tackle a mountain of dishes! His first trip to Churchill was in the winter of 2009 when he learned what cold REALLY felt like. Obviously he has recovered from his dishpan hands as he is back for the entire polar bear season 2009. Glad to have you back Steve!

The CNSC community would not be the same without the tireless contributions of the multitude of hardworking volunteers that pass our threshold each year. The CNSC would like to thank the following volunteers for their contributions:

Aurora Season 2009
Steven Stamp, England
Lucy Marshall, England

Summer 2009
Emma Berry, Scotland *(returning volunteer)*
Kyle Warkentin, Nova Scotia, Canada
Brett Rhyno, Ontario, Canada
Riley and Karen Caton, Oregon, USA
Emma Slater, England
Aisling Carrick, Wales

Polar Bear Season 2009
Holly Morrison, England
Heather Gray, Scotland
Inge Kielen, the Netherlands
Steven Stamp, England *(returning volunteer)*

L-R: Inge Kielen, Steven Stamp, and Heather Gray

Aurora Season 2010
Melanie Gamache, Winnipeg
Heather Gray, Scotland *(returning volunteer)*

WANTED

The CNSC is currently recruiting volunteers for our busy 2010 summer season which runs from mid-May to the end of August. Join us early in the season and experience the annual thaw and the arrival of the migrating birds. Mid-summer brings wildflowers, beluga whales and researchers in abundance! Watch out for polar bears! Bears arrive the first week of July. If you have 3-5 weeks that you would like to share with us please contact the Volunteer Coordinator at **cnsc@churchillscience.ca** for application instructions.

Established in 1976, the Churchill Northern Studies Centre is an independant, non-profit research station located along the western coast of Hudson's Bay.

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Stay tuned for the upcoming annual fundraising edition of the *Birdfish* later this summer. In the meantime, your contribution is still needed to ensure that our redevelopment meets all the expectations that YOU, our participants, researchers, and members have for the future of the CNSC. No contribution is too small. Every gift counts.

And it's so easy...
Clip this form and mail it with your cheque payable to:
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Or visit our web site at www.churchillscience.ca and click on the big blue Donate button. This will take you to a secure site that exclusively handles donations to organizations like ours. Additional information about the security features is provided on the web page.

Or just give us a call at (204) 675-2307.

All donations will be recognized in campaign materials and annual reports unless you wish to remain anonymous. Tax receipts are provided for contributions over $25. We welcome all US donations. Contributions over $250USD are tax deductible. Contact Kim at **(204) 675-2307** or **daley@churchillscience.ca** for details.

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Cover Photo: Roger Woloshyn